

CLAIMS

Claim 1 (Cancelled)

Claim 2 (Cancelled)

Claim 3 (Previously Presented): The mold assembly of Claim 4, wherein said gas permeable section has an average pore diameter of about 15 microns and a total porosity of about 15%.

Claim 4 (Currently Amended): A mold assembly operable to form a composite material, the mold assembly comprising:

a first mold member forming a punch;

a second mold member operable to join with and receive said first mold member, said second mold member including an opening formed therethrough for allowing the first mold member to move with respect to the second mold member; and

a third mold member placed over the opening formed through said second mold member, wherein a cavity is formed by the combination of the first mold member, second mold member and third mold member,

wherein at least one of the first, second or third mold members is include a thickness formed continuously of a porous gas-permeable metallic material to operable to vent gaseous reactants gasses formed within the cavity completely through the mold member to a location outside of the mold assembly which originate from chemical reactions occurring in said cavity during a molding operation while preventing recombination and condensation of said gaseous reactants within said section the porous mold member, and

wherein ~~said gas permeable section~~ the porous mold member has a porosity between about 5 to 25% and an average pore diameter between about 1 to 280 microns, and wherein the porous mold member gas permeable section controls venting of the gasses through the porous mold member while maintaining control over temperature and pressure being applied to mold material located within the cavity.

Claim 5 (Previously Presented): The mold assembly of Claim 4, wherein said metallic gas-permeable material is aluminum.

Claim 6 (Previously Presented): The mold assembly of Claim 4, wherein at least a portion of one of said first or second mold member is operable to heat said mold cavity.

Claim 7 (Previously Presented): The mold assembly of Claim 4, wherein said gas-permeable section is operable at temperatures less than about 210 degrees Celsius.

Claim 8 (Previously Presented): The mold assembly of Claim 4, wherein said gas-permeable section is operable at pressures between about 200 to 2,000 kg/cm².

Claim 9 (Previously Presented): The mold assembly of Claim 4, wherein the molded composite material is at least one of a friction material, phenolic resin, and a large reinforcement containing structure component.

Claims 10-53 (Cancelled)

Claim 54 (Previously Presented): The mold assembly of claim 4, wherein first mold member comprises a punch formed at least in part of micro-porous sintered aluminum.

Claim 55 (Previously Presented): The mold assembly of claim 54, wherein the entire first mold member comprises micro-porous sintered aluminum.

Claim 56 (Currently Amended): A mold assembly operable to form a composite material, the mold assembly comprising:

a first mold member comprising a punch defining an outer diameter, the first mold member being formed of micro-porous sintered aluminum; and

a second mold member defining an opening extending through the second mold member, the second mold member being adapted to receive the first mold member, wherein the opening includes an inner diameter that is generally the same as the outer diameter of the first mold member and wherein the first mold member is movable within the opening formed in the second mold member; and

a third mold member placed over the opening formed through said second mold member, wherein a cavity is formed by the combination of the first mold member, second mold member and third mold member,

~~wherein the first mold member defining the cavity includes an integrally formed porous gas permeable section operable to vent gasses therethrough which originate from chemical reactions occurring in said cavity during a molding operation without disturbing the formed mold cavity and while preventing recombination and condensation of said gaseous reactants within said section,~~

wherein at least one of the first, second or third mold members include a thickness formed continuously of a porous gas-permeable metallic material to vent gaseous reactants formed within the cavity completely through the mold member to a location outside of the mold assembly during a molding operation while preventing recombination and condensation of said gaseous reactants within the porous mold member and without disturbing the formed cavity,

wherein the first or second mold member includes a heater ~~is operable to heat the mold assembly at temperatures less than about 210 degrees Celsius, and~~

wherein ~~said gas permeable section~~ the porous mold member has a porosity between about 5 to 25% and an average pore diameter between about 1 to 280 microns, and wherein the porous ~~gas permeable section~~ mold member ~~controls venting of vents the gasses~~ gaseous reactants through the mold member at a rate between about 200-2000 kg/cm² while maintaining control over temperature and pressure being applied to mold material located within the cavity.

Claim 57 (Previously Presented): The mold assembly of claim 56, wherein the amount of heat provided by the first or second mold member is sufficient to cause reaction of the mixture within the cavity.

Claim 58 (Previously Presented): The mold assembly of claim 57, wherein the amount of heat and pressure provided by the first or second mold member is sufficient to cause reaction of a phenolic novolac resin and hexamethylenetetramine within the cavity.

Claim 59 (Previously Presented): The mold assembly of Claim 58, wherein the molded composite material is at least one of a friction material, phenolic resin, and a large reinforcement containing structure component.

Claim 60 (Cancelled)

Claim 61 (Previously Presented): The mold assembly of claim 56, wherein the first and second mold members are operable to heat the mold assembly.

Claim 62 (Previously Presented): The mold assembly of claim 56, wherein the second mold member includes a mold body.

Claim 63 (Previously Presented): The mold assembly of claim 4, wherein the third mold member comprises a plate.

Claim 64 (Previously Presented): The mold assembly of claim 56, wherein the third mold member comprises a plate.